	Division of Environmental Health and Communicable Disease Prevention	
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## Rocky Mountain Spotted Fever

### **Overview** <sup>(1, 2)</sup>

For a complete description of Rocky Mountain spotted fever, refer to the following texts:

- Control of Communicable Diseases Manual (CCDM).
- Red Book, Report of the Committee on Infectious Diseases.

### **Case Definition** <sup>(3)</sup>

#### ***Clinical description***

A tickborne febrile illness most commonly characterized by acute onset and usually accompanied by myalgia, headache, and petechial rash (on the palms and soles in two thirds of the cases)

#### ***Laboratory criteria for diagnosis***

- Fourfold or greater rise in antibody titer to *Rickettsia rickettsii* antigen by immunofluorescence antibody (IFA), complement fixation (CF), latex agglutination (LA), microagglutination (MA), or indirect hemagglutination antibody (IHA) test in acute-and convalescent-phase specimens ideally taken  $\geq 3$  weeks apart, or
- Positive polymerase chain reaction assay to *R. rickettsii*, or
- Demonstration of positive immunofluorescence of skin lesion (biopsy) or organ tissue (autopsy), or
- Isolation of *R. rickettsii* from clinical specimen


#### ***Case classification***

***Confirmed:*** a clinically compatible case that is laboratory confirmed

***Probable:*** a clinically compatible case with a single IFA serologic titer of  $\geq 64$  or a single CF titer of  $\geq 16$  or other supportive serology (fourfold rise in titer or a single titer  $\geq 320$  by Proteus OX-19 or OX-2, or a single titer  $\geq 128$  by an LA, IHA, or MA test)

### **Information Needed for Investigation**

- **Verify the diagnosis.** Determine what laboratory tests were conducted and the results.
- **Establish the extent of illness.** There is no evidence of natural person-to-person transmission; however, there have been cases reported in persons who removed infected ticks from other people or animals and in doing so, crushed the ticks and exposed themselves to infection from the tick.<sup>(4)</sup>

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## **Case/Contact Follow Up and Control Measures**

No contact follow up is required.

### **Control Measures**

See the Control of Communicable Diseases Manual, Rocky Mountain Spotted Fever, “Methods of control.”

See the Red Book, Rocky Mountain Spotted Fever, “Control Measures.”

## **Laboratory Procedures**


### **Specimens:**

- The Missouri State Public Health Laboratory (SPHL) does not test for rickettsial diseases. However, paired serum specimens can be sent through the SPHL to the Centers for Disease Control and Prevention for testing. Acute and convalescent serum specimens three or more weeks apart should be collected.
- Acute blood specimens can be collected and whole blood sent to the SPHL accompanied by CDC form 50.34; found in this Section or at: [http://www.cdc.gov/ncidod/dvbid/misc/CDC50\\_34.pdf](http://www.cdc.gov/ncidod/dvbid/misc/CDC50_34.pdf) (2 June 2003). The SPHL will hold the blood and send a reminder letter for the convalescent specimen.
- Acute blood can be collected, centrifuged and the serum removed and frozen until the convalescent blood is collected. Both acute and convalescent sera should be sent to the SPHL accompanied by CDC form 50.34 for forwarding to CDC for testing.
- Additional information on laboratory procedures can be obtained from the Regional Communicable Disease Coordinator or from staff at the SPHL. The SPHL telephone number is 573-751 0633 and the web site is: <http://www.dhss.state.mo.us/Lab/index.htm>. (2 June 2003)

## **Reporting Requirements**

Rocky Mountain Spotted Fever is a Category II disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS) within three days of first knowledge or suspicion by telephone, facsimile or other rapid communication.

1. For all cases, complete a “Disease Case Report” (CD-1).
2. For all cases complete a “Tick-Borne Rickettsial Disease Case Report” (MO 580-2602) revised 3-03.
3. Entry of the completed CD-1 into MOHSIS negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
4. Send the completed secondary investigation form to the Regional Health Office.
5. All outbreaks or “suspected” outbreaks must be reported as soon as possible (by phone, fax, or e-mail) to the Regional Communicable Disease Coordinator. This

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can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51)

6. Within 90 days of the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

## References

1. Chin, James, ed. "Rocky Mountain Spotted Fever (North American tick typhus, New World spotted fever, Tickborne typhus fever, São Paulo fever)." Control of Communicable Diseases Manual. 17<sup>th</sup> ed. Washington, DC: American Public Health Association, 2000: 430-432.
2. American Academy of Pediatrics. "Rocky Mountain Spotted Fever." In: Pickering, LK., ed. 2000 Red Book: Report of the Committee on Infectious Diseases. 25<sup>th</sup> ed. Elk Grove Village, IL. 2000: 491- 493.
3. Centers for Disease Control and Prevention. Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 1997: 46 (No. RR-10). "Rocky Mountain Spotted Fever (*Rickettsia rickettsii*)," 1996, <http://www.cdc.gov/epo/dphsi/casedef/rockycurrent.htm> (2 June 2003)
4. Walker, David H. and Didier Raoult. "Rickettsia Rickettsii and Other Spotted Fever Group Rickettsiae (Rocky Mountain Spotted Fever and Other Spotted Fevers)." Principles and Practice of Infectious Diseases. 5<sup>th</sup> ed. Eds. Gerald L. Mandell, John E. Bennett, and Raphael Dolin. New York: Churchill Livingstone, 2000: 2035-2040.

## Other Sources of Information

1. Woodward, Theodore E. and Dumler, J. Stephen. "Rocky Mountain Spotted Fever." Bacterial Infections of Humans Epidemiology and Control. 3<sup>rd</sup> ed. Eds. Alfred S. Evans and Philip S. Brachman. New York: Plenum, 1998: 597-612.
2. The Merck Veterinary Manual. 8<sup>th</sup> Ed. Ed. Susan E. Aiello. Whitehouse Station, NJ: Merck & Co., Inc., 1998: 47, 564, 924, 2168. <http://www.merckvetmanual.com/mvm/index.jsp> (search "Rocky+Mountain+spotted+fever"). (2 June 2003)

## Web Resources and Information

1. Centers for Disease Control and Prevention – Rocky Mountain Spotted Fever, <http://www.cdc.gov/ncidod/dvrd/rmsf/index.htm> (2 June 2003)
2. Association of State and Territorial Directors of Health Promotion and Public Health Education - Rocky Mountain Spotted Fever, <http://www.astdhphe.org/infect/rms.html> (2 June 2003)
3. New York State Department of Health - Communicable Disease Fact Sheet - Rocky Mountain Spotted Fever (tick-borne typhus fever), <http://www.health.state.ny.us/nysdoh/consumer/rocky.htm> (2 June 2003)

# **Rocky Mountain Spotted Fever**

## **FACT SHEET**

### **What is Rocky Mountain Spotted Fever?**

Rocky Mountain spotted fever is a serious, generalized infection that is usually spread to people by the bite of infected ticks. The disease gets its name from the Rocky Mountain area where it was first identified. However, it occurs in many other parts of the United States, including Missouri.

### **How do people get Rocky Mountain Spotted Fever?**

People ordinarily get Rocky Mountain spotted fever from the bite of an infected tick. At least four to six hours of attachment and feeding on blood by the tick are required before transmission can occur. Contamination of breaks in the skin or mucous membranes with crushed tissues or feces of the tick may also lead to infection. It is not spread from person-to-person, except on rare occasions by blood transfusion.

### **What are the symptoms?**

Sudden fever (which can last for two or three weeks), severe headache, tiredness, deep muscle pain, chills, or nausea. In about half of the cases, a red, raised rash appears on the arms and legs, particularly on the palms of the hands and soles of the feet, and then spreads to the trunk. Rocky Mountain spotted fever can be fatal if not treated promptly.

### **How soon after exposure do symptoms appear?**

The symptoms begin between 3 to 14 days after the tick bite.

### **What is the treatment?**

It can be treated with antibiotics. Many people with the disease require hospitalization.

### **How should a tick be removed?**

Ticks should be removed promptly and carefully by using tweezers and applying gentle, steady traction. Do not crush the tick's body when removing it and apply the tweezers as close to the skin as possible to avoid leaving tick mouthparts in the skin. Do not remove ticks with your bare hands. Protect your hands with gloves, cloth, or tissue and be sure to wash your hands after removing a tick.

After removing the tick, disinfect the skin with soap and water or other available disinfectants.

### **How can Rocky Mountain Spotted Fever be prevented?**

1. Avoid tick-infested areas, especially during the warmer months.
2. Wear light colored clothing so ticks can be easily seen. Wear a long sleeved shirt, hat, long pants, and tuck your pant legs into your socks.
3. Walk in the center of trails to avoid overhanging grass and brush.
4. Check your body every few hours for ticks when you spend a lot of time outdoors in tick-infested areas. Ticks are most often found on the thigh, arms, underarms, legs or where tight fitting clothing has been. Ticks should be removed immediately.
5. Use insect repellents containing DEET on your skin or permethrin on clothing. Be sure to follow the directions on the container and wash off repellents when going indoors. Carefully read the manufacturer's label on repellents before using on children.
6. Remove attached ticks immediately.

**Missouri Department of Health and Senior Services  
Section for Communicable Disease Prevention  
Phone: (866) 628-9891 or (573) 751-6113**



*Justification must be completed by State health department laboratory before specimen can be accepted by CDC. Please check the first applicable statement and when appropriate complete the statement with the \*.*

1. Disease suspected to be of public health importance. Specimen is:  
 (a) ☐ from an outbreak. (b) ☐ from uncommon or exotic disease.  
 (c) ☐ an isolate that cannot be identified, is atypical, shows multiple antibiotic resistance, or from a normally sterile site(s) (d) ☐ from a disease for which reliable diagnostic reagents or expertise are unavailable in State.

2. ☐ Ongoing collaborative CDC/State project.

3. ☐ Confirmation of results requested for quality assurance.

\*Prior arrangement for testing has been made.  
 Please bring to the attention of:  
 (Name): \_\_\_\_\_

Completed by: \_\_\_\_\_  
 Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Name, Address and Phone Number of Physician or Organization: \_\_\_\_\_

**STATE HEALTH DEPARTMENT LABORATORY ADDRESS:** \_\_\_\_\_

**STATE HEALTH DEPT. NO.:** \_\_\_\_\_ **DATE SENT TO CDC:** (MM/DD/YYYY) \_\_\_\_/\_\_\_\_/\_\_\_\_

**PATIENT IDENTIFICATION:** (Hospital No.) \_\_\_\_\_

**NAME:** (LAST, FIRST, MI) \_\_\_\_\_

**BIRTHDATE:** (MM/DD/YYYY) \_\_\_\_/\_\_\_\_/\_\_\_\_ **SEX:** ☐ MALE ☐ FEMALE

**CLINICAL DIAGNOSIS:** \_\_\_\_\_

**ASSOCIATED ILLNESS:** \_\_\_\_\_

**DATE OF ONSET:** (MM/DD/YYYY) \_\_\_\_/\_\_\_\_/\_\_\_\_ **FATAL?** ☐ YES ☐ NO

(FOR CDC USE ONLY)		CDC NUMBER		DATE RECEIVED
UNIT	FY	NUMBER	SUF	MO DA YR

REVERSE SIDE OF THIS FORM MUST BE COMPLETED

THIS FORM MUST BE EITHER PRINTED OR TYPED  
 PLEASE PREPARE A SEPARATE FORM FOR EACH SPECIMEN

D.A.S.H.

DATE REPORTED

MO DA YR

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Comments: \_\_\_\_\_

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DEPARTMENT OF HEALTH AND HUMAN SERVICES  
 Public Health Service  
 Centers for Disease Control  
 Center for Infectious Diseases  
 Atlanta, Georgia 30333



The Centers for Disease Control (CDC), an agency of the Department of Health and Human Services, is authorized to collect this information, including the Social Security number (if applicable), under provisions of the Public Health Service Act, Section 301 (42 U.S.C. 241). Supplying the information is voluntary and there is no penalty for not providing it. The data will be used to increase understanding of disease patterns, develop prevention and control programs, and communicate new knowledge to the health community. Data will become part of CDC Privacy Act system 09-20-0106, "Specimen Handling for Testing and Related Data" and may be disclosed: to appropriate State or local public health departments and cooperating medical authorities to deal with conditions of public health significance; to private contractors assisting CDC in analyzing and refining records; to researchers under certain limited circumstances to conduct further investigations; to organizations to carry out audits and reviews on behalf of HHS; to the Department of Justice in the event of litigation, and to a congressional office assisting individuals in obtaining their records. An accounting of the disclosures that have been made by CDC will be made available to the subject individual upon request. Except for permissible disclosures expressly authorized by the Privacy Act, no other disclosure may be made without the subject individual's written consent.





STATE OF MISSOURI  
DEPARTMENT OF HEALTH AND SENIOR SERVICES  
**TICK-BORNE RICKETTSIAL DISEASE CASE REPORT**

CDC NO. (1-4)	MOHSIS ID NUMBER
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**Use for:** Rocky Mountain spotted fever (RMSF), ehrlichiosis (human monocytic ehrlichiosis [HME], and human granulocytic ehrlichiosis [HGE]).

**PATIENT/PHYSICIAN INFORMATION**

PATIENT'S NAME		DATE SUBMITTED (5-12) ____ / ____ / ____ MM/DD/YY	
ADDRESS (NUMBER, STREET)		CITY	
PHYSICIAN'S NAME	PHYSICIAN TELEPHONE NUMBER	NETSS ID NUMBER (IF REPORTED) (13-23) <div><div>CASE ID</div><div>SITE</div><div>STATE</div></div>	

**DEMOGRAPHICS**

1. STATE OF RESIDENCE (24-25) Postal Abbrv. <div></div>	2. COUNTY OF RESIDENCE (26-50)	<input type="checkbox"/> CHECK IF HISTORY OF TRAVEL OUTSIDE COUNTY OF RESIDENCE WITHIN 30 DAYS OF ONSET OF SYMPTOMS. IF YES, WHERE _____	3. ZIP CODE (51-59) <div></div>
4. SEX (60) 1 <input type="checkbox"/> MALE 2 <input type="checkbox"/> FEMALE	5. DATE OF BIRTH (61-68) ____ / ____ / ____ MM/DD/YY	6. RACE (69) 1 <input type="checkbox"/> WHITE 3 <input type="checkbox"/> AMERICAN INDIAN/ALASKAN NATIVE 9 <input type="checkbox"/> NOT SPECIFIED 2 <input type="checkbox"/> BLACK 4 <input type="checkbox"/> ASIAN 5 <input type="checkbox"/> PACIFIC ISLANDER	7. HISPANIC ETHNICITY (70) 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO
8. INDICATE DISEASE TO BE REPORTED (71) 1 <input type="checkbox"/> RMSF 2 <input type="checkbox"/> HME 3 <input type="checkbox"/> HGE 4 <input type="checkbox"/> EHRLICHIOSIS (UNSPECIFIED, OR OTHER AGENT)			

**CLINICAL SIGNS, SYMPTOMS, AND OUTCOMES**

9. SYMPTOMS (72) ANEMIA 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK FEVER > 100 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK HEADACHE 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK	MALAISE 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK MYALGIA 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK NAUSEA 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK RASH 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK	VOMITING 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK THROMBOCYTOPENIA 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK LEUKOPENIA 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK ELEVATED LIVER ENZYMES 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK	
10. DATE OF ONSET OF SYMPTOMS (73-80) ____ / ____ / ____ MM/DD/YYYY	11. WAS AN UNDERLYING IMMUNOSUPPRESSIVE CONDITION PRESENT? (81) 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK SPECIFY CONDITION(S): _____		
12. SPECIFY ANY LIFE-THREATENING COMPLICATIONS IN THE CLINICAL COURSE OF ILLNESS (82) 1 <input type="checkbox"/> ADULT RESPIRATORY DISTRESS SYNDROME (ARDS) 3 <input type="checkbox"/> MENINGITIS/ENCEPHALITIS 8 <input type="checkbox"/> OTHER: _____ 2 <input type="checkbox"/> DISSEMINATED INTRAVASCULAR COAGULOPATHY (DIC) 4 <input type="checkbox"/> RENAL FAILURE 9 <input type="checkbox"/> NONE			
13. WAS THE PATIENT HOSPITALIZED BECAUSE OF THIS ILLNESS? (83) 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK (IF YES, DATE) (84-91) ____ / ____ / ____		14. DID THE PATIENT DIE BECAUSE OF THIS ILLNESS? (92) 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK (IF YES, DATE) (93-100) ____ / ____ / ____	

**LABORATORY DATA**

15. NAME OF LABORATORY	CITY	STATE	ZIP CODE <div></div>
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Below, indicate Y (yes) or N (no) ONLY if the test or procedure was performed. LACK OF SELECTION indicates that the test or procedure was not performed.

16. SEROLOGIC TESTS	SEROLOGY 1 COLLECTION DATE (101-108) ____ / ____ / ____ MM/DD/YYYY		SEROLOGY 2* COLLECTION DATE (109-116) ____ / ____ / ____ MM/DD/YYYY		17. OTHER DIAGNOSTIC TESTS?	POSITIVE?
	TITER	POSITIVE?	TITER	POSITIVE?		
IFA-IgG		1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (117)		1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (118)	PCR	1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (133)
IFA-IgM		1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (119)		1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (120)	Morulae visualization*	1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (134)
OTHER TEST (121-130)		1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (131)		1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (132)	Immunostain	1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (135)
					Culture	1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO (136)
* WAS THERE A FOURFOLD CHANGE IN ANTIBODY TITER BETWEEN THE TWO SERUM SPECIMENS? (137) 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO					* Visualization of morulae not applicable for RMSF.	

**EPIDEMIOLOGICAL FEATURES**

18. TICK EXPOSURE 1. TICK BITE OR ATTACHMENT WITHIN 21 DAYS OF ONSET? 2. IF NO TICK BITE OR ATTACHMENT, WAS PATIENT IN A KNOWN TICK INFESTED AREA WITHIN LAST 21 DAYS? 3. DID ANY OTHER FAMILY MEMBER HAVE A SIMILAR ILLNESS THIS YEAR? IF YES TO QUESTION 1 OR 2, WHERE? (STATE, COUNTY) _____	1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK 1 <input type="checkbox"/> YES 2 <input type="checkbox"/> NO 9 <input type="checkbox"/> UNK
---	---

**FINAL DIAGNOSIS**

19. CLASSIFY CASE BASED ON THE CDC CASE DEFINITION (138-148) 1 <input type="checkbox"/> RMSF 2 <input type="checkbox"/> HME 3 <input type="checkbox"/> HGE 4 <input type="checkbox"/> EHRLICHIOSIS (unspecified, or other agent) _____	(149) 1 <input type="checkbox"/> CONFIRMED 2 <input type="checkbox"/> PROBABLE
---	---

**STATE HEALTH DEPARTMENT OFFICIAL WHO REVIEWED THIS REPORT**

NAME	TITLE	DATE (MM/DD/YYYY) ____ / ____ / ____
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OTHER PERTINENT EPIDEMIOLOGICAL DATA (TO INCLUDE PROBABLE SOURCE)